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## Key components in an online class

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## Key components in an online class

### Abstract

This literature review focuses on what needs to be in place to have an effective online class. Instructional design models, interactive learning communities, learning theories, and instructional/student technology training are some of the issues that the literature review documents. The purpose of this literature review is to examine research on the topics of the instructional design process and the transformation of a traditional classroom to an online classroom. The conclusions formed within this document are based upon literature reviews about the topics of effective online classes. This review has led to a conclusion that online education can be an effective learning environment if the necessary key components are in place.

KEY COMPONENTS IN AN ONLINE CLASS

A Graduate Review

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Masters of Arts in Education

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By

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## ABSTRACT

This literature review focuses on what needs to be in place to have an effective online class. Instructional design models, interactive learning communities, learning theories, and instructional/student technology training are some of the issues that the literature review documents. The purpose of this literature review is to examine research on the topics of the instructional design process and the transformation of a traditional classroom to an online classroom. The conclusions formed within this document are based upon literature reviews about the topics of effective online classes. This review has led to a conclusion that online education can be an effective learning environment if the necessary key components are in place.

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## INTRODUCTION

Fast paced and pervasive changes are occurring in economic, social, and technological foundations of education and educational delivery (Dirr, 1999). Online, web-based instruction has grown in importance, as distance education has become more widespread (Simonson, Smaldino, Albright, & Zvacek, 2003). As a result, educational consumers have choices of how and from whom they can secure a good education (Connick, 1999). As more nontraditional students return to get an education, they are often reluctant to give up their current jobs, leave their families, interrupt their social life, or spend precious time commuting back and forth to the traditional classroom. To effectively meet the needs of society, distance education educators should be knowledgeable in distance education and able to delivery it appropriately (Cyr, 1997).

Society has and will continue to see changes in educational delivery, with an evolving pedagogy of learning that is constructive, interactive, collaborative, and learner centered. Online education has grown significantly over the past decade and the number of colleges and universities' offering online education has increased dramatically. The United States Department of Education found the cost of distance education programs in higher education was \$11.4 billion in 2003. The National Center for Education Statistics (NCES) (2005) also highlights that during the 12-month 2000–2001 academic year, 56 percent (2,320) of all 2-year and 4-year Title IV-eligible, degree-granting institutions offered distance education courses for any level or audience (i.e., courses designed for all types of students, including elementary and secondary, college, adult education, continuing and professional education, etc.). Twelve percent of all institutions indicated that they planned to start offering distance education courses in the next three years.

These numbers are extremely significant because distance education will dictate changes in behavior for both the teacher and learner (W.R. Hambrecht & Co., 1999).

Businesses and society are demanding that educational systems keep up with advancing technology in the delivery of education. Therefore, distance education has a major and varied impact worldwide. A strong demand exists in the world for distance education opportunities (Simonson et al., 2003).



## Statement of the Problem

According to the National Center for Education Statistics in 2004, 1,680 institutions were offering distance education courses. Combined, these institutions provide the distance education student over 54,000 online classes. If compared to the academic year 1994-1995, where only 26,000 online classes were delivered, one would see a very dramatic increase. Enrollment in 2002 was expected to reach 2.23 million for distance education courses. This involved 15% of all higher education students. The demand for learning and re-training in today's workforce, which is estimated at the equivalent of 20 million full-time students, is so huge that a new university would need to be opened every eight days to accommodate the large number of students, if online classes were not an option. An example of the phenomenal growth of enrollment in online classes is the University of Phoenix with 230,180 students enrolled as of November 30, 2004 (NCES, 2005).

The technology-enhanced learning environment can increase the pedagogical effectiveness of course content at a distance (Sherry, 1996). Today, the online class environment is a part of a new educational culture with its own distinct characteristics. Universities are offering online classes as an important alternative, and many traditional educators are making the transition to the online environment. An overview of American society indicates that 43% of homes have a personal computer (Pew, 1999) and 45 million Americans have online access (Iconocast, 2000), which shows computer owners have transitioned themselves to the online environment.

Richard W. Riley, former Secretary of Education, points out students will be expected to have technology skills for careers and future success. From 1998 to 2005,

there was a 70% growth in computer and technology-related jobs. In this Information Age, information is the currency that drives the economy, and without access to information or necessary tools, they cannot participate in this economy (Riley, 1998).

Educators are moving courses from the traditional classroom environment to an online class. This literature review will identify certain components that should be in place to create an effective online environment. Traditional pedagogical tools should change for educators to design an effective online course. The components that will be addressed include:

1. Learning Theory
2. Instructional Design Models
3. Learning Styles
4. Interactive Learning Communities

#### Outline of the Review

This review of literature focuses on what needs to be in place to have an effective online class. Instructional design models, interactive learning communities, learning theories, and instructional/student technology training are some of the issues that the literature review will cover. This paper will consist of four parts. The first part is the *Introduction*, providing a limited background of information and issues pertaining to distance education. The second part is the *Methodology*, describing the method used for locating and identifying sources. The third part is the *Analysis and Discussion*, including the review of literature. The evidence from sources will demonstrate key components that should be considered for an effective online learning environment. The fourth part is the

*Conclusions and Recommendations*, which summarizes and extends the review of literature.

## METHODOLOGY

To gather research and information on distance education, the literature focuses on effective instructional design, learner theory, characteristics, collaboration, and interaction. Additional research is included about student preferences in distance education and the benefits of online classes.

This review of literature will examine the key components needed for an effective distance education environment. The sources located focus on the study and research of an effective online learning environment. Information collected for this literature review is from the following sources:

1. Instructor recommended books, journal articles, and educational databases on the subject matter.
2. Prior classes where valid research articles and information were acquired.
3. Electronic database articles searched and reviewed from various websites, like ERIC, Google, EBSCO, for information on distance education. Some key words that were used were for electronic searches *online classes, effective online learning environments, learner theories, instructional strategies, and increase in distance education.*

## ANALYSIS AND DISCUSSION

This analysis and discussion includes valid research from experts in the field to help the reader understand some of the required components to create an effective online learning environment. Factors including instructional design, learning theories and characteristics, and collaborative learning for distance education are presented.

### History of Technology use in Classrooms

Over the past decades, technology has been used in a variety of ways and for a variety of purposes. As new technologies emerged, they have often replaced or were used concurrently with earlier technologies, dramatically changing the way technology has been used in classrooms. Computers and related technologies have been used as tutors, surrogates, and supplemental teachers of the regular curriculum. Technologies have and are being used as tools for teaching and learning, as delivery modes for distance education, and for educational management applications, including improved planning, data analysis, communication, and personal productivity. One of the earliest uses of computers in classrooms was to teach the traditional curriculum and basic skills, often operating as a means to deliver instruction, sometimes as a supplement to the teachers' classroom instruction, and sometimes in lieu of the teachers' instructions. Much of the software focused on basic skills and knowledge in various content areas; used programmed instruction, drill and practice, and was often based on behaviorism and reductionism for instructional design. As time progressed, with the change in use came questions about how to evaluate the effect of the technology on student learning, but, in most instances, research relied on standardized test scores or other traditional measures of achievement. Distance education has grown exponentially over the last several years;

learning is taking place in the nontraditional delivery of instruction. The growth and content available on the Internet is a large factor in increasing online education, along with new technologies, developments in telecommunications, and the increasing user-friendliness and affordability of personal computers (Salsas, Kosarzycki, Burke, Fiore, & Stone, 2002).

### Changing Classroom Environments

Technology of one kind or another has always been used in the educational environment. The printed page, chalk and chalkboard, overhead projectors, filmstrips, and other devices continue to be utilized in the teaching and learning process. However, the use of these technologies often confined instructional and learning activities to a specific place and time. Computers were introduced in education delivery in the 1970s; its initial use was drill and practice instruction and was often based on behaviorism and reductionism for its instructional design. They were focused on the teaching of basic skills and content based on behaviorist theory. Educators who used a more student-centered curriculum and learning environment employed the use of computers as a teaching and learning tool to enhance learning. Students followed the commands on the computer screen receiving rewards for the correct answers; students also began learning through playing games and simulation software. Teachers discovered the value of word processing software and soon students were writing more and revising with ease. Other teachers saw the value of the computer in creating a rich learning environment and had students use databases, spreadsheets, and presentation and research tools for all subject areas (Fouts, 2000).

The next technology evolution was impacted by the use of the Internet in education. Suddenly there was a volume of knowledge available to students and teachers and a network of people throughout the world that enhanced communication and the exchange of ideas. Real problem solving in collaborative groups enriched the learning environment. Online courses became available and expanded learning opportunities in a variety of subject areas. As a result, a completely new learning environment became available and has continued to grow significantly (Fouts, 2000).

The adoption and use of technologies for instruction and learning is believed worthwhile, particularly because of their prevalence throughout society. Society is undoubtedly influenced by technology. Although some people may not be ready or willing to admit it, technology and innovations will continue to play an increasingly prominent role in organizational educational systems as well as in businesses, social, and personal relationships. A survey by Iconcast (2000) found that 43% of American homes have a personal computer and nearly 45 million homes have online access. Many of the technologies are widely used in the workplace and students are expected to be familiar with them before they enter the workforce. People need to recognize that technology is transforming part of everyday life for many people and institutions need to prepare students to use technology effectively, in and out of the classroom. Not only should institutions teach about how to use the technology, hardware and software, they must promote responsible use of technology, including dealing with intellectual property, copyright law, and the effective use of resources (Duhaney & Devon, 2000).

It is frequently thought that the education sector is slow in adapting to technological changes. Never the less, the classroom is receptive to technological

innovation, as this is where the old and new must coexist. The coexistence of old and new technology creates a tension that can lead to remarkable changes in education for the twenty-first century and beyond (Duhaney & Devon, 2000).

### Diffusion of Innovation Theory

Rogers (1995) states that diffusion is a process that occurs over time and has five distinct stages: (a) *Knowledge*; (b) *Persuasion*; (c) *Decision*; (d) *Implementation*; and (e) *Confirmation*. The potential adopters of online learning must first learn about the innovation, educators must decide to adopt, implement the innovation, and confirm or reject the decision to adopt the innovation. Rogers' theory is so well known in the instructional design technology literature that Sachs stated (As cited in Surry, D. 1997). "After looking at the literature in our field, one might get the impression that the only important thing we need to know about is how to encourage the adoption of innovations or how to be better change agents and there are five stages to the innovation adoption process" ( p.2).

Rogers' Diffusion of Innovation Theory (1995) provides guidelines used to describe and understand how innovations are adopted within a social system, such as online learning. The theory provides an overview of the process by which an innovation is adopted and gains acceptance by members of a community.

According to Rodgers (1995) the first stage of the diffusion process is *Knowledge*, the adopters find out about the innovation by hearing about the process, which could be taking the traditional classroom and offering it as an online class. In this stage, educational entities would find out how and what it is to gain a basic understanding of the innovation.



The second stage of the process is *Persuasion*, the educational institution or potential adopters evaluate the innovation to form a positive or negative impression of the innovation to make the transition from a traditional class to an online class.

The third stage of the process is *Decision*, where the innovation is either accepted or rejected; the educational entity decides it is ready to make the transition from traditional course instruction to online course instruction, and to implement it.

The fourth stage of the process is *Implementation*, the innovation is put into place; the educational entity has made the transition from offering traditional courses to offering online courses.

The fifth stage of the process is *Conformation*, the adopter looks for more information about the innovation and continues or discontinues it, and the educational entity evaluates the online class to see if it was effective and if learning took place. Rogers' Diffusion of Innovation Theory provides guidelines for online instructors to evaluate technologies that will be used to provide an effective online learning environment.

The four major factors that influence the diffusion process are: (a) the innovation itself; (b) how information about the innovation is communicated through a channel over a specified time; (c) the nature of the social system into which the innovation is being introduced; and (d) the innovation may consist of a new idea or series of ideas, a new thought process, a new product or any number of inventions. This process can refer to the development of a traditional course taught in the classroom or an online class. Diffusion theory relates to the communication process where participants create and share information with the goal of reaching a mutual understanding. The channel can take the

form of on an online class ranging from mass communication to interpersonal communication. Rapid technological growth and advances in computer technologies have contributed to the increasing number of online courses offered. To remain competitive, educational institutions are pressured to embrace distance education. Educational institutions must have an effective strategy in place to support instructors with the transition from the traditional classroom to an online class. With the integration of technology into an online class, instructors can use Diffusion of Innovation Theory as a process through which the instructor passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea for an effective online learning environment.

Educational institutions should support instructional design and transition from the traditional classroom to the online environment. Burkman (1987) provides a list of five attributes that coincide with Rodger's Diffusion of Innovation Theory method for developing online instruction that would be more appealing to the instructors: (a) identify the potential adopter, (b) measure relevant potential adopter perceptions, (c) design and develop a user-friendly product, (d) inform the potential adopter (of the product's user-friendliness) and, (e) and provide support and post-adoption support. According to Burkman the infusion and integration of new information technologies used in online education have had an immense impact on the education environment in educational technology, and have identified the ways in which information technology has affected the educational process. Learning, which was once based in a traditional school classroom, has changed with the use of new technologies not only for educational

systems, but also in almost every form of social activity, from work to entertainment and home life and the way education is delivered (Duhaney & Devon, 2000).

### Learning Theory and Online Learning

Constructivism is one of the most cited theories of learning in online literature. Constructivism learning theory emphasizes the student's construction of reality. In the constructivist theory students are not perceived as vessels waiting for information to be dumped in their minds. Students are, instead, thought of as engaged individuals who seek understanding of the real world around them through actively learning and discovery (Driscoll, 2000). Constructivists assert that knowledge is embedded in an activity, not delivered by professional lectures or the memorization of facts. Proponents of this student-centered perspective assert that truth or knowledge is based on students' real life experiences as they learn in complex environments (Koyangi, 1997).

Constructivists categorized learning conditions into five recommendations for teachers:

1. Embedded learning is complex, and requires realistic and relevant environments
2. Provide for social negotiation as an integral part of learning
3. Support multiple perspectives and the use of multiple modes of representation
4. Encourage ownership of learning
5. Nurture self-awareness of the knowledge of the construction process.

One way instructional designers of an online course can create a realistic and relevant learning environment is by creating hyper-links to websites on the subject matter. This allows students the chance to explore new ideas, and concepts in a rich exchange of information, which is unlimited by geographical location and time (Driscoll, 2000).

## Instructional Design

The curriculum for an online class should focus on application of knowledge to the real world and foster critical thinking skills with opportunities for the interaction of ideas among students and the facilitator. It must be designed for short-term use and the collaborative nature of the online class. The course content and agenda should be organized in units with clear deadlines and instructors should give simple and clear assignments, which are easy for students to follow. Online questions should be left open ended to allow for student discussion and interaction of the subject matter. In addition, online curriculum should focus on the application of knowledge to real world situations, promote critical thinking skills, and prompt students to do more research on the subject matter. Online curriculum has two important factors they are: process and outcomes. The process must integrate life, work, and educational experiences; generate continuous dialog; and allow students to relate a connection between the learned concepts and real life or work experiences. To prevent students from getting overwhelmed, ample time must be allowed for the completion of assignments and incorporation of group and team activities to maintain a balance between the technology, facilitator, and students. The course outcomes must be reachable and offer the opportunity for students to use them in practical, everyday situations. This will encode the subject matter into long-term memory and make it more meaningful to the students. Online curriculum should have clear objectives using appropriate technologies and a clear choice of techniques for facilitation and interaction. The learning objectives must be relevant to the learning needs of the students, as everyone learns in their own unique way (Simonson et al., 2003). The

instructor should use an instructional design model to develop and design online training materials using the following process:

- Analyze, the initial needs assessment to determine what the problem is and what are the desired goals or course outcome,
- Design the instructional unit to meet the learning objectives,
- Develop, the instructional materials to meet a variety of learning styles,
- Implement the unit of instruction and revise it if necessary, and
- Evaluate the unit of instruction to see if it was effective and if learning took place (Simonsen, et al., 2003).

During this process, the instructional designer will often collaborate with a site facilitator who often assists as the designer and monitor of an online class and has a powerful influence on the student's success or failure in the classes. Site facilitators are well-trained professionals who know how to integrate life experiences, communication, and content into the online learning environment. The personality of the site facilitator is very important as well, as they have set the tone of the online educational environment. Site facilitators should be encouraging and positive to students, so they can develop a level of comfort at the beginning of the class. When site facilitators make the transition from the traditional classroom to the online environment their role changes from distributor of information in a teacher-centered learning environment to discovery learning in a student-centered environment. The instructor is no longer a *sage on the stage*, but the online instructor becomes the *guide on the side*, helping students to discover and synthesize the learning material. Facilitators must believe in the effectiveness of the

online paradigm and the value of critical thinking skills for students to achieve the goals of the course outcome (Illinois Online Network, 2004).

For the instructional design of an online class to be effective, the design must address the different student learner characteristics. Instructors can obtain this information in a variety of ways. They can contact instructors who previously had the students in their class, ask students what works for them, and conduct surveys or use other information gathering techniques. Instructors can offer an alternative activity for students to choose which best fits their individual learning style. The first week of class could be spent getting to know the students and students getting to know the instructor by having online discussions, asking introductory questions, and having the students post this information to an discussion board, encourage online interactivity and collaboration, assign one-to-one email or use a variety of other ways (Simonson et al., 2003).

Educational institutions must meet the demands of society to develop courses that are interactive, collaborative, and meet the needs of the students (Kirschner, 2003). Educational designers need to determine the most effective way to incorporate technology into the online learning environment to meet different learning styles. Educational institutions must meet the needs in developing online courses for the next generation of students; a constructivist based design can provide a framework to create a powerful learning environment, which is not restricted by geographic location.

### Learning Styles and Characteristics

Blackmore (1996) suggested that one of the first things educators can do to enhance the learning environment is to be aware of the different learning styles in the student population. Teaching can be delivered in as many different ways as there are to

learn. Educators need to remember that people do not all see the world in the same way, just as they have different learning preferences of when, where, and how to learn.

The idea that people learn differently is venerable and probably had its origin with the ancient Greeks. Educators have evaluated learning styles for many years: some students prefer certain methods of learning to others. These traits are referred to as learning characteristics or learning styles. Educators should be aware of different learning styles and that they may vary from the traditional classroom to the online environment, and design instruction accordingly (Morrison, Sweeney, & Heffernan, 2003).

Assessing student-learning styles can be a valuable instructional tool in the development of an online course since the instructional design should include activities that complement student-learning needs. "Developing quality learning environments require that educators have a deep understanding of how individuals and groups of students learn" (Anderson, 1985, p. 28). With the understanding of students' learning styles, an instructor can select a variety of teaching methods to meet the needs of the learners. Assessing learning styles can help instructors recognize that each student has a unique style of learning, just as they are unique individuals. There are several definitions of learning styles and frameworks available to assess learning styles. Gardner's (1995) model of learning styles is defined "as three distinct but interconnected dimensions".

1. Perceptual dimension mode (physiological or sensory) of learning is influenced by physical and sensory elements that reflect the body's response to external stimuli. It includes a range of perceptual elements: visual, auditory, tactile, and kinesthetic.

2. Cognitive mode (mental or information processing) is the style of learning that refers to learners' ways of receiving, storing, retrieving, transforming, and transmitting information.

3. Affective mode (emotional or personality characteristics) of learning encompasses all aspects of personality, with personality traits at the core initiating the evolutionary process of learning. Personality sets the stage for how one acquires and integrates information. It reflects genetic influences as well as the influences of culture, environment, and experiences (p.20).

The online curriculum should be designed to fit a variety of learning styles. Instructional designers may choose to use a learning-style instrument to evaluate the learners.

Instructors should evaluate a variety of learning-style instruments before selecting an instrument, looking at the validity, reliability, and instrument cost. After the selection, instructors can administer the instrument and use the results to decide on teaching methods to meet the individual needs of the learners. These learning evaluation instruments can provide a practical guide for implementing methods, activities, and strategies based on the instrument's unique results (Gardner, 1995).

Understanding the learner can give instructors the needed information to ensure a positive relationship between the course and student goals. Instructors should know the learners and why they have elected to participate in the class, what the learners want to learn from the course, and how they are willing to be part of the learning process. Clear articulation of student learning goals can help the instructor select the appropriate instructional strategies to achieve the desired learner outcomes (Wiggins & McTighe, 1998).



One of the most popular learning style inventories, often used in distance education is the Kolb Learning Style Inventory (LSI) (Kolb, 1986). The LSI measures student learning style preference in two popular dimensions, over time either from concrete experiences or from engaging in abstract conceptual analysis when acquiring new skills and knowledge. Students may emphasize interests by turning theory into practice, through active experimentation, or they may prefer to engage in reflective thinking about their experiences, by relating the new knowledge to something meaningful to real life experiences. Gardner (1995) described Kolb's LSI as a cognitive learning style model where the cognitive processes include storage and retrieval of information in the brain and represent how the learners perceives, thinks, problem solve, and remembering. Successful online students prefer to look at abstract concepts to help explain the concrete experiences associated with their learning. Gardner's 1995 study used the LSI to evaluate the effect of learning style on student retention in a graduate level program in the online environment. The study showed a higher percentage of students with different learning styles can be successful in an online environment. Technology can be implemented as a functional tool to meet many different learning styles and used to improve the instructional delivery system. The audience or the distant learner is often considered after the planning and organizing of the hardware, content, and the instructional plan. Since the learner is the crucial member of the distance-learning environment, the instructional design needs to consider the learner early in the planning and implementation of an online class. The more the instructor understands the members of the audience, the better the distance learning experience will be for all involved (Gardner, 1995).

The distance learner can be of any age, have attained any educational level, and have a variety of educational needs. One common characteristic of the distance learner is an increased commitment to learning. Distance learners tend to be self-starters and highly motivated to learn and succeed. Distance learners often live in diverse geographical locations, usually off-campus or far away from campus so that it is not convenient for them to attend the traditional classroom. The online instructors should treat each member of an online class an individual, although each individual may live in a different geographical location. Each individual has a cultural identity, as well as a socioeconomic standing in the community. However, each individual is unique and needs to be recognized for those unique characteristics. When the individual is considered, characteristics such as attitude or interest, prior experiences, cognitive abilities, and learning styles will have an impact. Taking the time to learn about the individual will enhance the learning experience for that individual and for the class as a whole (Simonson et al., 2003).

Instructors who identify why a student may be in an online class and what that student is hoping to achieve in the learning process, can provide valuable information to support the student. The Office of Technology Assessment (OTA, 1988) has suggested that there are four major differences between distance learners and the traditional classroom learners are:

1. Motivation: individual reasons for participation in an online learning class varied from convenience for the nontraditional student, to accessibility to coursework. Distance education students chose to be in the online classroom to continue their

education. Simonson et al., (2003) also suggest that individual motivation is the main characteristic for students to be successful in an online class.

2. Experience: students who felt comfortable after their first online experience were willing to enroll in additional classes. Students, who felt satisfied with their learning experience, and the convenience factors, are reinforced by their participation. These students had a strong desire to learn, as they were willing to commute to a traditional classroom if necessary to continue their education, although they may prefer distance education. An effective instructor will limit the discomfort students may experience in their first online class by designing the class in a non-intrusive manner and use technology as a learning tool. An effective online class requires the instructor and student to take responsibility in a dynamic learning experience.

3. Cognitive abilities; these play an important role in the success of a student in the online environment. Students who do well in the traditional classroom usually do better in an online class, because these students tend to have the ability to take charge of their individual learning and the responsibility that go with it.

4. Learning styles; students learning styles are the fourth component of successful online learning environment, this is the unique individual learning characteristic.

Instructors who identify the four major differences suggested by the OTA can incorporate the use of technology to deliver online instruction offers instructors a wide variety of mediums to meet the different learning styles and to place greater emphasis on providing visual aids, whether the technology is synchronous, such as audio only, or two-way full motion video, or asynchronous, such as a complete Web-based class. Visual aids will enhance the learning process of the visual learner. Auditory learners can focus on the

instructor's words and listen better because there are fewer distractions; this is often done in the comforts of the learner's home. Students who are sometimes reluctant to speak out in the traditional classroom can find their niche by utilizing text-based instructional delivery, by computer-based discussions, and by completing written assignments. Hands-on activities such as Virtual Web field trips can meet the needs of kinesthetic learners. Instructors should get to know their students and different learning styles when designing and online class to ensure that learning will take place.

Authentic learning is a learning characteristic of constructivism, which refers to students engaging in meaningful tasks, not just clicking the mouse button to go to another web-link. Authentic learning allows students to become immersed in the course goals and learning environment, and will affect how and what they learn (Simonson et al., 2003).

### Interactive Learning Communities

Communication has been a part of human nature since the dawn of time, humans have always communicated in one way or another. New forms of technology eliminate geographic barriers, making it possible for people from around the world to join or be a part of a group, giving one a sense of belonging if they so choose, even when there may be no other person physically present (Beege & Masterson, 2000). Compensation for physical absence of an instructor can be best achieved by creating an interactive online learning community, with a supportive learning environment (Quinn, 2000).

Online learning deals with instruction in which distance and time are critical attributes, since students and instructors are separated by distance and/or time. Interactivity in instruction under these time and distance constraints is a variable that is likely to affect the success of an online class. Interaction in an online class can reduce the

sense of isolation among individual students and help them to adjust to the new learning environment (Palloff & Pratt, 1999). Interaction among students and between students and instructor, with a high quality of content and instruction is a critical component for a successful online class. The instructor must maximize learners' interactions and discussions during the online class. Instructional designers and instructors must be familiar with the technology medium being used. They need to have a thorough understanding and competence in using the technology. The online learning environment offers new ways to develop learning communities through social negotiation. Online discussion, email, chat rooms, blackboards, software, group projects, and other computer-based technologies can be successful in creating an effective interactive learning environment. Social interaction in the traditional classroom is also effective in the online environment; this includes social opportunities such as cooperative learning and learning communities. The use of a constructivist-based approach allows students to learn by doing, work with others, and have authentic learning experiences making the learning more relevant and motivating (Jonassen, Peck, & Wilson, 2003).

Interactive learning can be synchronous or asynchronous or a combination of the two. Synchronous learning is where "the teacher and students perform interactively at the same time, at the same place, and in every learning action they perform" as in the traditional classroom (Cohen, 1999, p.222). In asynchronous learning the teacher and students interact but do not always deal with the same topic at the same time, it does not require the simultaneous participation of all students and instructors at the same time. Student may choose their own time frame and gather learning materials according to their own schedules. Sorg and McElhinney (2003) analyzed an online course that used the

synchronous format for discussions. There was no required face-to-face interaction, like in the traditional classroom. The researchers collected qualitative data from learning journal entries, personal interviews, observation of online interactions, and reflective journals. Their findings indicated that synchronous computer conferences and discussions created a meaningful learning environment and that participants had a sense of belonging, took charge of their learning, and also created an effective learning community.

Effective learning communities require a high interaction among all class members. One must maintain that, unlike most organizational cultural communities, a learning community must be open, allowing students and instructors to engage in any learning opportunity with classmates, and from a variety of sources. This will permit everyone to develop relationships with other learners and educators outside the traditional classroom (Heckscher & Donnellon, 1994). The key concepts to the creation of a learning community and successful facilitation online are simple including honesty, responsiveness, relevance, respect, openness, and empowerment. Instructional designers must apply this framework into the development and design of an online class to create a learning community with the group of students in order for the learning process to be successful (Palooff & Pratt, 1999).

The interactive learning community must be a safe place for students to express themselves without the fear of how they will be perceived while allowing for active, rich discussion. Instructors and facilitators must be able to create this atmosphere of safety and community in all learning settings, whether they are electronic or face-to-face. Online students need to be able to speak and debate their ideas without fear of retribution from any source, and should be encouraged to explore and research topics that may not

be an explicit part of the course outcome. Instructors and facilitators need to empower the students and provide gentle guidance while students explore their ideas and construct knowledge. The online learning community is where instructors, facilitators, and students become equal partners, as students become expert when it comes to their learning styles. The development of community as part of the learning process helps to create a learning experience that is empowering and rich. It is an essential component in the design of an online course to maximize the use of technology as a medium (Palooff & Pratt, 1999).

According to Wagner (1997) interactions involve behaviors by individuals and groups directly influenced by each other: interactivity tends to focus on the attributes of the technology system. Wagner's research shows that interactions and interactivity have a commonality in the learning environment and contribute to an active learning environment. Interactions are a central part of many on-line learning environments using two functional typologies; interactions as facilitators and interactions as outcomes. These are interactions that occur (a) between the learner and the instructor, (b) among learners, or (c) between learners and the content they are trying to master. This schema provides categories about the types of interactions within the instructional design of an online course. Wagner suggests that interaction forms imply the purpose, intent, and intended outcomes of interaction by specifying what is involved in an effective online learning community. The use of Wagner's research can assist online course designers. The learner-teacher interaction can take place in the instructional delivery of online courses, provide feedback to students, and encourage learners with constructive feedback. Students may interact and learn with each other and the instructor in discussing the subject matter through many forms of media such as, online discussions, emails and

written text. Learner-content, is a very important component in effective learning communities. Online discussions empower students to take charge of their learning by giving them more time to formulate a response or think in depth about the subject matter (Wagner, 1994).

Wagner approaches interaction types in a more detailed fashion by considering the outcomes of interactions. Interactions refer to the outcomes of students' educational experiences and they should be used to increase student participation, communication, and course outcomes. Interaction should support feedback, enhance retention and transfer, support metacognition, encourage team or class development, emphasize discovery and exploration in the subject, and provide clarification and closure as needed. Wagner emphasizes that outcomes should include, but are not limited to, specific learning objectives and reflect the increasing importance of social interaction in instructional design as the demand for distance education escalates.



## CONCLUSION AND RECOMMENDATIONS

Today, online class environments are a part of a new educational culture with its own distinct characteristics. Colleges and universities are offering online classes as an important alternative and many traditional educators are making the transition to the online environment. Educators are moving courses from the traditional classroom environment to an online class, and traditional pedagogical tools are changing to enable educators to design effective online classes. While the number of online classes is increasing at an extremely rapid rate, instructional designers and curriculum developers should consider how they prepare for teaching and interactions between and among students in the distance learning process. This review of literature has listed some of the pedagogical components that need to be in place to have an effective interactive online learning environment.

Rodgers' Diffusion of Innovation Theory provides guidelines for instructors to understand how innovations are adopted within a social system, such as online learning. The knowledge of learner's individual differences and learning styles should be used in the instructional design of an online class, to help learners achieve the desired learning goals.

Students taking an online course have definite learning styles and characteristics. When designing effective online learning environments, instructors must consider the goals, needs, and characteristics of students, the content that is required, technical constraints, and support. To design and develop an effective learning environment that will address the learning styles and characteristics of the students, the instructional designer should use an instructional design model to *analyze* the initial needs assessment

to determine what the problem is and what the desired course outcomes are. *Design* the instructional unit to meet the needs of the learning objectives. *Develop* or choose instructional materials to meet a variety of learning styles. *Implement* the unit of instruction and revise it if necessary and *evaluate* the unit of instruction to see if it was effective and if learning took place (Simonsen, et al., 2003).

To effectively meet the needs of society, distance educators should be knowledgeable in the design, delivery, and evaluation of distance education. Institutions must meet the needs in developing online course for the next generation of students; a constructivist-based design can provide a framework to create a powerful learning environment, which is not restricted by geographic location.

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